

## 01/08/14 Agenda

- Expectations
- Section 6.1 - Ratios & Proportions - Review
- Homework Worksheet 4

Section 6.1 - Ratios & Proportions

Targets 6A & 6B

Goals:	<p>Simplify &amp; apply ratios in various situations while performing conversions.</p> <p>Use proportions to solve geometry problems.</p> <p>-----</p>
Today's	1. Write and simplify ratios.
Takeaways:	2. Use ratios to perform conversions.
	3. Write and solve proportions.
SWBAT	4. Use extended ratios to solve geometric problems.

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*Goal 1. Write and simplify ratios.*

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Ratio:

A ratio compares two numbers using division.

Ex.  $\frac{a}{b}$      $a$  to  $b$      $a:b$ 

Ratios are usually expressed in simplest form.

If  $a$  and  $b$  have the same units, you can just simplify the fraction (ratio). If not, you need to convert the units, then simplify.Ex. A room is 28 feet long by 21 feet wide. What is the ratio of the length of the room to it's width?

$$\frac{28}{21} = \frac{4}{3}$$

~~1.333~~

## Section 6.1 - Ratios & Proportions

Targets 6A & 6B

*Goal 2. Use ratios to perform conversions.*

Conversions: If a ratio has unlike units, you need to multiply by a conversion factor.

Example: 
$$\frac{5\cancel{ft}}{20\cancel{in.}} \cdot \frac{12\cancel{in.}}{1\cancel{ft}} = \frac{60}{20} = \frac{3}{1}$$

**Goal 3. Write and solve proportions.**

Proportions: Two ratios that are equal to each other.

$$\begin{array}{ccccc} \text{extreme} & \xrightarrow{\text{red}} & a & = & c & \xleftarrow{\text{blue}} & \text{mean} \\ & & \downarrow & & \downarrow & & \\ & & b & = & d & & \\ & & \uparrow & & \uparrow & & \\ & & \text{mean} & & \text{extreme} & & \end{array}$$

$$\begin{array}{ccc} & \text{extremes} & \\ & \swarrow \quad \searrow & \\ a : b & = & c : d \\ & \swarrow \quad \searrow & \\ & \text{means} & \end{array}$$

**Cross Products Property:** In a proportion, the product of the means equals the product of the extremes.

If  $\frac{a}{b} = \frac{c}{d}$  where  $b \neq 0$  and  $d \neq 0$ , then  $ad = bc$ .

$$\frac{9}{3} = \frac{24}{x}$$

$$\begin{aligned} 9x &= 3 \cdot 24 \\ 9x &= 72 \\ \frac{9x}{9} &= \frac{72}{9} \\ x &= 8 \end{aligned}$$

$$\begin{aligned} \frac{1}{(x-3)} &= \frac{4}{3x} \\ 3x &= 4(x-3) \\ 3x &= 4x - 12 \\ -3x & \quad -3x \\ \hline 0 &= x - 12 \\ +12 & \quad +12 \\ \hline 12 &= x \end{aligned}$$

If it takes 6 gallons of paint to paint 120 sections of fence, how many gallons will it take to paint 230 sections?

$$\begin{aligned} \frac{6 \text{ GAL.}}{120 \text{ SECTIONS}} &= \frac{x \text{ GAL.}}{230 \text{ SECTIONS}} \\ 120x &= 6 \cdot 230 \\ 120x &= 1380 \\ \frac{120x}{120} &= \frac{1380}{120} \\ x &= 11.5 \text{ GAL.} \end{aligned}$$

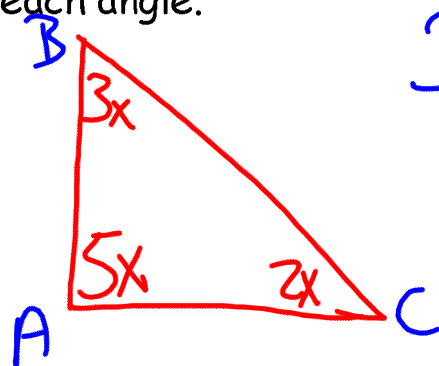
## Section 6.1 - Ratios

## Target 6A

*Goal 4: Use extended ratios to solve geometric problems.*

Extended  
Ratios:

The ratio of the angles in a triangle are ~~3x~~ ~~5x~~ ~~2x~~. Find each angle.



$$3x + 5x + 2x = 180^\circ$$

$$10x = 180^\circ$$

$$x = 18^\circ$$

$$\begin{aligned}\angle A &= 5x = 5 \cdot 18 = 90^\circ \\ \angle B &= 3x = 3 \cdot 18 = 54^\circ \\ \angle C &= 2x = 2 \cdot 18 = 36^\circ\end{aligned}$$